

AL 11148

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

NOV 14 1977

ALBERTA POWER LIMITED
144 kV TRANSMISSION LINE
FROM LLOYDMINSTER TO METISKOW

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Decision Report 77-12ADA
Application 770171

1 INTRODUCTION

1.1 The Application and Hearing

Alberta Power Limited made application pursuant to sections 9, 11, and 14 of The Hydro and Electric Energy Act for a permit to construct and a licence to operate that portion of a Metiskow to Lloydminster 144 kV¹ single-circuit transmission line from the Battle River north to Lloydminster, and an approval to connect the transmission line to the transmission system of Calgary Power Ltd. The application also requested approval of a substation near Lloydminster. The route of the proposed transmission line and the location of the substation are shown on Figure 1.

A public hearing to consider the application was held before the Energy Resources Conservation Board at the Court House in Wainwright on 15 June 1977 with D. R. Craig, P.Eng., G. J. DeSorcy, P.Eng., and C. J. Goodman, P.Eng. sitting.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives
(Abbreviation Used in Report)

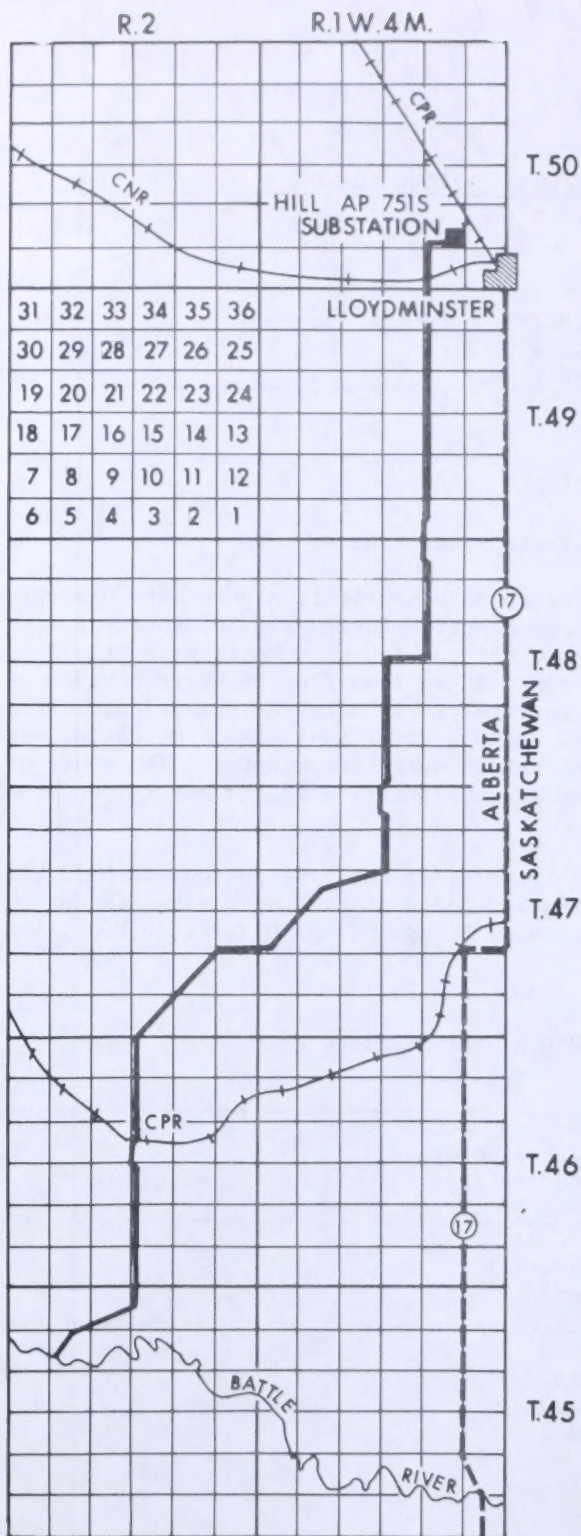
Witnesses

Alberta Power Limited
(Alberta Power)
D. R. Bailey

A. Morin, P.Eng.

Calgary Power Ltd.
(Calgary Power)
B. K. O'Ferrall

¹ kV is the symbol used in this report for kilovolts (thousands of volts).



— ALBERTA POWER PROPOSED TRANSMISSION LINE AP 749L

FIGURE 1 ROUTE OF PROPOSED TRANSMISSION LINE OF ALBERTA POWER

Clifford A. Ranger
C. A. Ranger

Energy Resources Conservation Board
(Board Staff)
A. L. McLarty
D. G. Beamer, C.E.T.
K. Kendrick

1.2 Background and Application

Alberta Power's Vegreville District service area is currently served from the Battle River power plant by two 144 kV transmission lines as shown in Figure 2. The Lloydminster area is fed from the Vermilion substation by two 72 kV transmission lines.

Alberta Power proposed to increase capacity and improve reliability to its Vegreville District service area by adding 749L, a 144 kV transmission line, from Lloydminster to the Calgary Power Metiskow substation CP 648S as shown on Figure 2. Alberta Power applied to construct that portion of the line from the Battle River north to Lloydminster, and Calgary Power applied by Application No. 770232 to construct that portion of the line south from the Battle River to the Metiskow substation. Alberta Power would then make an arrangement with Calgary Power respecting the southern portion of the line and operate the line to meet its system needs.

1.3 Definition of the Issues

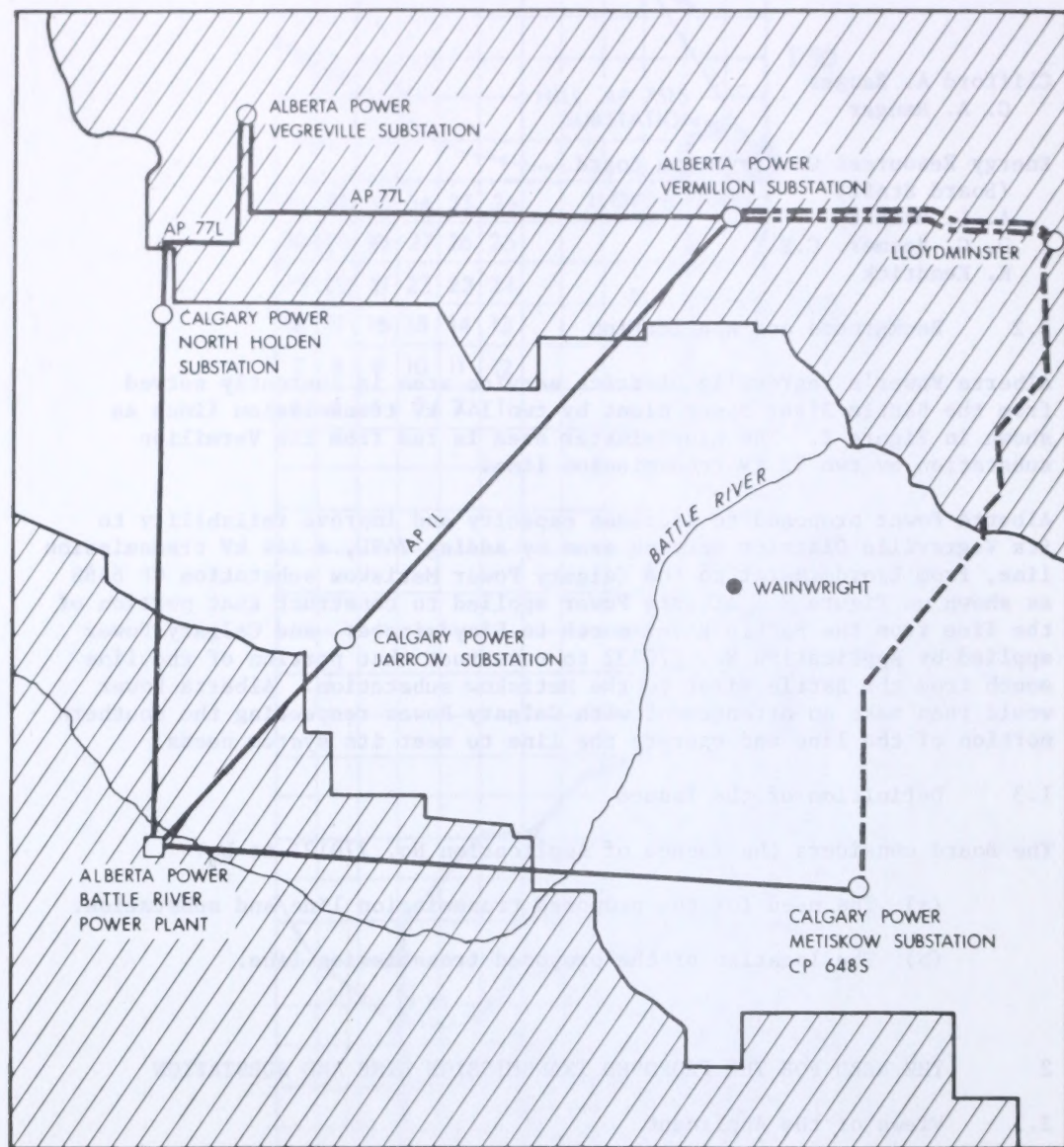
The Board considers the issues of Application No. 770171 to be:

- (a) The need for the proposed transmission line and substation.
- (b) The location of the proposed transmission line.

2 THE NEED FOR THE PROPOSED TRANSMISSION LINE AND SUBSTATION

2.1 Views of the Applicant

Alberta Power stated that the proposed transmission line and substation are required to provide firm capacity to its Vegreville District service area for single contingency outage conditions. The applicant indicated that the Vegreville District is dependent on supply through two 144 kV circuits AP 1L and AP 77L, which are fed power from the Battle River power plant. Alberta Power pointed out that, with one of these circuits out of service, the Vegreville District load must be supplied by the remaining 144 kV circuit.



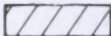
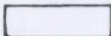
- EXISTING 144 kV TRANSMISSION LINES
- - - EXISTING 72 kV TRANSMISSION LINES
- · - · - PROPOSED 144 kV TRANSMISSION LINE
-  ALBERTA POWER SERVICE AREA
-  CALGARY POWER SERVICE AREA

FIGURE 2 PROVINCIAL ELECTRIC SYSTEM, BATTLE RIVER-LLOYDMINSTER AREA

Alberta Power testified that with circuit AP 1L out of service and a Vegreville District load of more than 75 MW² the voltages would drop to 90 per cent of normal on the 72 kV system in the Grand Centre and Lloydminster areas. Table 1, which is based on a typical load-duration curve, presents the applicant's forecast of the approximate hours and days when the Vegreville District load may exceed 75 MW. The Vegreville District load demand varies both seasonally and daily with the greatest demand being in the winter. The table shows that in the 1976/77 climatic year, the load demand may exceed 75 MW on 30 different days for a total of 50 hours. However, the 50 hours and 30 days would not be evenly distributed throughout the year. Alberta Power forecasts that, by 1980/81, the load demand will exceed 75 MW during a total of 1 000 hours spread over 140 days.

TABLE 1 ALBERTA POWER FORECAST OF VEGREVILLE DISTRICT LOAD

Climatic Year (1 Oct. to 30 Sept.)	Anticipated Peak Load (MW)	No. of Hours During Which Load May Exceed 75 MW	No. of Days During Which Load May Exceed 75 MW
1976/77	88	50	30
1977/78	92	225	65
1978/79	97	400	100
1979/80	100	750	120
1980/81	106	1 000	140

Alberta Power said that the proposed circuit would also provide increased capacity to the Lloydminster area. It stated that the loss of one of the two 72 kV circuits serving the Lloydminster area would result in voltage levels below 90 per cent of normal on the 72 kV system in this area.

2.2 Views of the Board

The Board accepts the load forecast for the Vegreville District submitted by Alberta Power and notes that neither of the interveners questioned the need for the line. The Board is aware of the possibility of low voltages and the need for load shedding if an outage was to occur to one of the 144 kV circuits serving the Vegreville District. In order to maintain adequate service and to alleviate the problems that could occur,

² MW is the symbol used in this report for megawatts (millions of watts).

additional transmission capacity should be built into this area. The Board believes that the additional 144 kV circuit and substation proposed are suitable to meet the increased energy demands of the area and will provide adequate transmission capacity.

3 THE LOCATION OF THE PROPOSED TRANSMISSION LINE

3.1 Views of the Applicant

Alberta Power stated that the closest substation to the Lloydminster area was the Metiskow substation which is connected to the Battle River power plant by a 240 kV line presently operating at 144 kV. The applicant indicated that it evaluated two routes between Metiskow and the Lloydminster area and that the proposed route was the best.

It said that the proposed transmission line north of the Battle River (as described in the subject application) would generally be located parallel to statutory road allowances or property boundaries, or centred on a 50-foot right of way for those portions which lie diagonally cross-country. In response to Mr. Ranger's intervention, Alberta Power stated that the line would not be located on his property but would be two feet on the road allowance next to the property.

3.2 Views of Interveners

Mr. Ranger, who owns the South-west quarter of Section 9, Township 49, Range 1, West of the 4th Meridian, stated that he did not object to the route of the proposed transmission line after learning that the line would not be located on his property. No other objections were raised with respect to Alberta Power's proposed route.

3.3 Views of the Board

The Board notes that certain portions of the applicant's route lie diagonally across farmland and believes that some comment is warranted with respect to a choice between diagonal and boundary routes. Recognizing that all transmission lines crossing farmland will have some negative impact on farming, the Board observes that diagonal routes may have a greater nuisance impact for the individual farmer whereas boundary routes, because such routes increase the total length of line and number of structures on farmland, have the potential for a greater total impact on the farming community. In weighing diagonal versus boundary routes, the proportion of boundary routes along roads and fences should be balanced against the reduced length (and thus reduced cost and total impact) on the diagonal, and the amount of uncultivated land on the diagonal. Also, diagonal routes may more easily bypass residences whereas boundary routes along roads and fences often pass close to residences.

The Board believes that the choice between a diagonal and boundary route must be made on an individual situation basis. In this particular instance since there were no specific objections to the diagonal section of the route and since the applicant has obtained easements for the entire route the Board sees no reason not to accept the route as proposed.

As noted in Section 1.2 of this report, Calgary Power filed a related application for the portion of the line south of the Battle River. There were several objections to the proposed Calgary Power route and one group of interveners proposed an alternative route which would move the river crossing about one mile east. If this alternative south of the river were approved, Alberta Power would have to alter the route of the line immediately north of the river. The Board is still considering the Calgary Power application, and consequently is not prepared to approve the portion of the Alberta Power line south of Section 10, Township 46, Range 2, West of the 4th Meridian, until the route south of the river is decided.

4 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Ministers of the Environment and of Energy and Natural Resources for their approval of the application as it affects matters of the environment.

The Board, in compliance with section 10, has referred the application to those ministers, and those ministers, having regard for the Board's disposition of the application, have given their approvals of the application insofar as it affects matters of the environment. For purposes of compliance with section 10, subsection (2), any permit issued by the Board will be made subject to the same conditions, if any, imposed by the Ministers of the Environment or of Energy and Natural Resources, when they gave their approvals of the application.

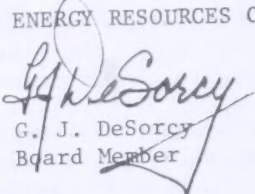
5 DECISION

The Board grants the application of Alberta Power Limited to construct and operate the applied for 144 kV transmission line, except for that portion south of Section 10, Township 46, Range 2, West of the 4th Meridian. The Board also grants the application as it relates to the construction and operation of the Hill substation. The Board approves in principle the interconnection of the new line with Calgary Power's

transmission system. However, the Board will not approve the point of interconnection until the route of the remaining portion of the line is decided upon. The necessary permits, licences and approvals are being issued concurrently with this decision.

DATED at Calgary, Alberta on August 16, 1977.

ENERGY RESOURCES CONSERVATION BOARD


G. J. DeSorcy
Board Member

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

DECISION ON THE REQUEST BY THE ALBERTA
GAS TRUNK LINE COMPANY LIMITED FOR A
PERMIT TO CONSTRUCT A PIPELINE FROM
EAGLESHAM TO GORDONDALE

Decision Report 77-13
Application 770366

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1 INTRODUCTION

1.1 The Application

The Alberta Gas Trunk Line Company Limited applied pursuant to The Pipeline Act, 1975, for a permit to construct a pipeline comprised of approximately 73 miles of 16-inch diameter steel pipe for the transmission of natural gas from a point in legal subdivision 1 of Section 13, Township 78, Range 26, west of the 5th Meridian, near Eaglesham to a point in legal subdivision 16 of Section 2, Township 79, Range 12, west of the 6th Meridian near Gordondale; and a sales meter station in legal subdivision 3 of Section 12, Township 79, Range 12, west of the 6th Meridian, also near Gordondale. The proposed route is shown in Figure 1.

1.2 The Hearing

A public hearing of this application was held on 22 June 1977 in Calgary, Alberta, with D.R. Craig, P.Eng., C.J. Goodman, P.Eng., and V.E. Bohme, P.Eng. sitting.

THOSE WHO APPEARED AT THE HEARING

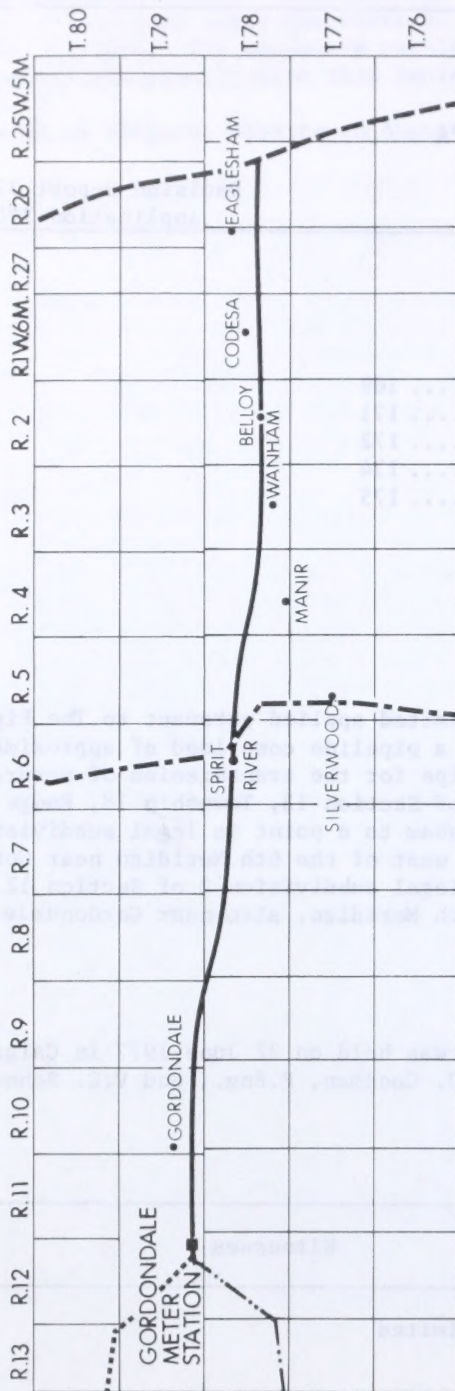
Principals and Representatives
(Abbreviations used in Report)

Witnesses

The Alberta Gas Trunk Line Company Limited
(Trunk Line)

G.R. Forsyth, Q.C.
H.G. Williamson

D.G. Olafson, P.Eng.
G.P. Berard, P.Eng.
D.G. Snyder, P.Eng.



— PROPOSED ALBERTA GAS TRUNK LINE COMPANY LIMITED PIPELINE FOR THE TRANSMISSION OF NATURAL GAS. (APPLICATION NO. 770366)

--- EXISTING ALBERTA GAS TRUNK LINE COMPANY LIMITED PIPELINE.

-.- EXISTING GRANDE PRAIRIE TRANSMISSION CO. LTD. PIPELINE.

..... EXISTING WESTCOAST TRANSMISSION COMPANY (ALBERTA) LTD. PIPELINE.

----- EXISTING PACIFIC PETROLEUMS LTD. PIPELINE.

FIGURE 1 EAGLESHAM-GORDONDALE AREA

The Canadian Petroleum Association (CPA)

B.W. Jones

Hudson's Bay Oil and Gas Company Limited

N.G. Sauder

Imperial Oil Limited (Imperial)

W.M. Samoil

Pan-Alberta Gas Ltd. (Pan-Alberta)

J. Stein

Shell Canada Resources Limited

A.P.G. Walker

TransCanada Pipe Lines Limited

E.W.H. Mallabone

Energy Resources Conservation Board staff

A.L. McLarty

R.J. Allman, P.Eng.

J.D. Anderson, P.Eng.

1.3 The Issues

The Board considers the principal issues of the application to be

- a) need for a pipeline,
- b) proposed route, and
- c) pipeline design.

2 NEED FOR A PIPELINE

2.1 The Applicant's Views

Trunk Line stated that the need for the pipeline arose from a request by Pan-Alberta for Trunk Line to transfer on Pan-Alberta's behalf certain quantities of gas to Gordondale where it would be sold to Westcoast Transmission Company Limited. The specific volumes and removal permits were previously approved by the Board, and the necessary authority of the Board to remove gas from the Province is contained in the Board's

permit to Pan-Alberta PA 74-1, assented to by Order in Council, numbered O.C. 1076/74, and dated June 26, 1974. Trunk Line contended that in order to move the volumes of gas under Pan-Alberta's contract - daily average and maximum rates of 72 million cubic feet and 125 million cubic feet respectively - the facilities would be required for on-stream delivery by November 1, 1977.

In addition to requiring this pipeline for gas deliveries to Westcoast, Trunk Line said that the lateral would also be used to carry gas to market from Teepee Creek and Josephine.

2.2 The Interveners' Views

Counsel for Imperial questioned the applicant on the relationship between this application and one made earlier (Application No. 9219), for the construction of a 36-inch diameter pipeline from the Dunvegan junction to the Gold Creek junction. Imperial was concerned as to whether the gas reserves in the Gordondale area had been used to justify both the previous application and the present one, and if so, how the two situations could be compatible.

None of the other interveners offered any evidence for or against the need for the proposed pipeline.

2.3 The Board's Views

The Board agrees with the applicant that a pipeline is required to meet Pan-Alberta's contract commitments to Westcoast Transmission Company Limited. It also agrees that the possibilities for the lateral to carry gas from potential sources in areas such as Teepee Creek and Josephine will increase the usefulness of the pipeline. The matter raised by Imperial is dealt with in section 4.

3 PROPOSED ROUTE

3.1 The Applicant's Views

The applicant stated that the most favourable routing of the pipeline was the shortest distance from its main line near Eaglesham to the delivery point at the Gordondale meter station, while having regard for minor local variations because of difficult terrain conditions. The proposed route had the further advantage of passing close to future gas supply areas.

Concerning the land status situation, Trunk Line testified in direct evidence at the hearing that it had obtained all necessary easements along the proposed right of way.

Under questioning, Trunk Line indicated that no formal environmental study had been prepared, but qualified this by stating that environmental factors had been taken into consideration during the survey of the line, and that an in-house environmental evaluation of the route had been made. A detailed study by consultants and Trunk Line staff of river and stream crossings had been undertaken and, although some potential bank slippage was anticipated, it would be resolved by normal methods. Some wet areas were found along the route, and while these would not pose any unusual environmental problems, swamp weights would be used to avoid pipe floatation.

In answer to a Board staff query as to whether consideration was given to locating the pipeline along existing utility, road, railway or other rights of way, Trunk Line said that it had investigated these possibilities. Except for its plan to parallel about 3 miles of the Westcoast system at the west end of the route, other corridor routings had been found unacceptable for reasons of additional pipeline length, proximity to populated areas, and extra construction costs. The applicant said that it had not considered existing power line rights of way as potential pipeline corridors.

Trunk Line stated that it had examined a shorter alternative route from Dunvegan to the Gordondale meter station location, but this was ruled out primarily by the difficult and costly crossing of the Peace River that would be required. The 13 mile saving in line length would be more than offset by the expense of the river crossing and the need for additional looping and compression on the Dunvegan lateral.

Trunk Line summed up its position by saying that it had no evidence to suggest there were any environmental concerns along the route of the pipeline, and this was confirmed by the fact that the Department of the Environment was satisfied with the proposed route.

3.2 The Interveners' Views

None of the interveners opposed the route of the proposed pipeline.

3.3 The Board's Views

The Board generally agrees with the applicant's criteria for route selection, and, after having evaluated the evidence presented in the hearing and studying the material subsequently submitted to it by Trunk Line, believes that the intended route is environmentally satisfactory. The Board is of the opinion, however, that the applicant should have provided as part of its application an environmental impact document in which would be addressed the existence or otherwise of any environmentally sensitive matters.

The Board has examined the alternative route from Dunvegan to the Gordondale delivery point considered by the applicant, and concludes that it would offer no significant advantage over the route chosen. It believes that the terrain difficulties and costly design modifications cited outweigh the shorter distance involved.

4 PIPELINE DESIGN

4.1 The Applicant's Views

Trunk Line pointed out that six alternative designs were studied to determine the most economic system to carry 125 MMcfd from its Foothills System to the Gordondale delivery point, and the applied for facility was the most economic one. The working papers to substantiate these calculations were not part of the application, but Trunk Line made them available to the Board for study following the hearing. The applicant explained that the design was based on the peak day sales at Gordondale of 125 MMcfd although the average flow was expected to be 72 MMcfd. The design of the line also took into consideration the possibility of reversal of flow in order to deliver all or part of the gas from Teepee Creek and Josephine to Trunk Line's 36-inch main line near Eaglesham.

Trunk Line observed that, since the incremental cost of service for the Gordondale lateral would be lower than the system-wide cost of service, gas delivered to the main line from the area could be delivered to Empress with virtually no incremental main line cost. In addition, gas exchange arrangements along the system would result in savings of fuel gas valued at approximately \$500,000 per year. Trunk Line maintained that the 16-inch line size was warranted by the sales gas volumes alone, and since the proposed route is through an area where there is good potential for reserves, any reserves picked up would supplement the Pan-Alberta gas volumes and would enhance the economics of the operation.

With respect to the costs of overall system service, Trunk Line stated that its present application in no way detracts from the economics of the 36-inch Foothills loop, and the development of reserves under the present plan would reflect favourably in cost of service to its customers. It indicated that the quantities of gas to be carried in the proposed pipeline, plus the gas moving through the Worsley connection to Westcoast, together would be about equal to the 175 MMcfd that was assumed to move westward in the economic justification of the 36-inch main line loop. Accordingly there would not be an adverse effect on the overall system costs.

Trunk Line also submitted a gas reserves appraisal by its consultant, J.L.J. Exploration Consultants Ltd., which indicated that recent gas finds in the general area exceeded the volumes put forward in support of the 36-inch Foothills extension last June, and these finds had more than offset the switch in reserves from the 36-inch loop line to the proposed Gordondale lateral.

In response to questioning on the possibility of an overpressure situation occurring in the Gordondale lateral, Trunk Line explained that the higher design pressure of the proposed line relative to the pressures in the main line or secondary branch lines would preclude such an occurrence. Trunk Line further explained that because of the possible two-way flow arrangements, a check valve could not be installed at the tie-in point with the

36-inch main line, but an automatic valve at that location would be activated to prevent backflow should depressurization occur in the Gordondale lateral. In addition, a number of block valves installed along the lateral would function automatically in the event of a pressure drop.

4.2 The Interveners' Views

Imperial expressed some concern over the effect of the proposed line on Trunk Line's overall cost of service, since earlier plans by Trunk Line for a lateral to move gas from Gordondale to Dunvegan were part of the justification for a 36-inch loop of Trunk Line's main line. Imperial pointed out that the proposed 16-inch Gordondale lateral to transport gas west was a major change from the previous plans. Notwithstanding the concerns it expressed, Imperial indicated it basically agreed with CPA's position which was to not oppose the pipeline.

None of the other interveners commented on the line size or design of the proposed pipeline.

4.3 The Board's Views

The Board is satisfied that the design of the proposed pipeline complies with the regulations under The Pipeline Act, 1975. It has approved all technical aspects of the application, and is of the opinion that the safety measures outlined by Trunk Line provide as much protection as is necessary to ensure that the effects of a major rupture would be minimized.

The Board has studied the working documents submitted by the applicant subsequent to the hearing concerning matters of cost of service and design alternatives, and concludes that the design of the Gordondale lateral as proposed by the applicant is satisfactory to meet Pan-Alberta's needs.

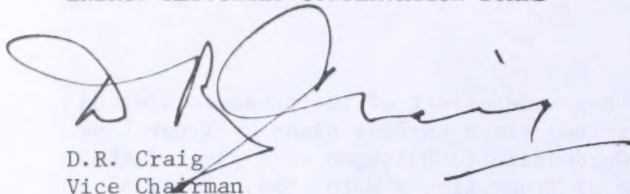
Respecting Imperial's concerns relative to overall cost of service, the Board believes that the change in Trunk Line's plans, which led to the subject applications and to some reallocation of gas deliverability, does not significantly alter the situation that was foreseen at the time of the Board's consideration of the 36-inch Foothills main line loop. Accordingly, the Board concludes that the proposed pipeline will not adversely affect the overall cost of service of the Trunk Line system.

5 DECISION

The Board grants the application to construct a pipeline commencing from a point in legal subdivision 1 of Section 13-78-26 W5M to a point in legal subdivision 16 of Section 2-79-12 W6M, and a sales meter station in legal subdivision 3 of Section 12-79-12 W6M.

The appropriate permit to construct the pipeline and the sales meter station will be issued to the applicant in due course.

ENERGY RESOURCES CONSERVATION BOARD



D.R. Craig
Vice Chairman

DATED 28 July 1977
Calgary, Alberta

